

REMARKS / ARGUMENTS

This application is believed to be in condition for allowance because the claims, as amended, are believed to be non-obvious and patentable over the cited references. The following paragraphs provide the justification for this belief. In view of the following reasoning for allowance, the Applicant hereby respectfully requests further examination and reconsideration of the subject patent application.

1.0 Objection to Drawings:

In the Office Action of June 8, 2007, the Examiner correctly noted a typographical error in Step 460 of FIG. 4. Specifically, Step 460 of FIG. 4 has been amended to recite:

“FIND SMALLEST c_i SUCH THAT $E(c_i) > T$ ”

A replacement drawing sheet is being filed herewith. Applicants believe that the above-noted amendment to FIG. 4 is sufficient to correct the error noted by the Examiner. Consequently, Applicants respectfully request withdrawal of the objection to FIG. 4.

2.0 Objections to the Specification:

In the Office Action of June 8, 2007, several informalities were noted in the specification. Applicants have amended the specification to address these formalities by including the information and wording suggested by the Examiner.

In particular, paragraphs [0052], [0056], [0089] and [0091] of United States Patent Application Publication No. 20050055201 have been amended to include the language suggested by the Examiner. In addition, in reviewing the Specification, Applicants also noted additional typographical errors in paragraph [0088]. Specifically, steps “520” and “530” in paragraph [0088] should be steps “420” and “430”, respectively. Applicants have amended paragraph [0088] to correct these errors.

No new matter is introduced by way of the above described amendments. Consequently, Applicants respectfully request withdrawal of the objections to the specification.

3.0 Rejections under 35 U.S.C. §103(a):

The Office Action rejected claims 1-4, 10, 15-16, 21-24, 28-32 and 36 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent 7,031,916 to Li, et al. (hereinafter "**Li**") in view of U.S. Patent 6,865,162 to Clemm. (hereinafter "**Clemm**").

In order to deem the Applicant's claimed systems, method, and process unpatentable under 35 U.S.C. §103(a), a prima facie showing of obviousness must be made. However, as fully explained by the M.P.E.P. Section 706.02(j), to establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, **to modify the reference** or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, **the prior art reference (or references when combined) must teach or suggest all the claim limitations**.

Further, in order to make a prima facie showing of obviousness under 35 U.S.C. 103(a), all of the elements of an Applicant's claims must be considered, especially when they are missing from the prior art. If a claimed element is not taught in the prior art **and has advantages not appreciated by the prior art**, then no prima facie case of obviousness exists. The Federal Circuit court has stated that it was error not to distinguish claims over a combination of prior art references where a material limitation in the claimed system and its purpose was not taught therein (*In Re Fine*, 837 F.2d 107, 5 USPQ2d 1596 (Fed. Cir. 1988)).

3.1 Rejection of Claims 1-4 and 10:

In general, the Office Action rejected independent claim 1 under 35 U.S.C. §103(a) based on the rationale that the proposed **Li - Clemm** combination reference discloses the Applicants claimed "...system for encoding an audio signal ..."

Specifically, the Office Action first suggests that **Li** discloses the claimed system with the exception of the step of "buffering each sequential unknown type segment in a segment buffer until analysis of a subsequent segment identifies the subsequent segment type as any of a speech segment and a silence segment." The Office Action then suggests that the **Clemm** reference discloses the claimed buffering since it is "obvious to one having ordinary skill in the art to buffer segments as suggested by *Clemm* in a method for encoding voice activity... of 'unknown type segments' of *Li et al.* for a purpose of ensuring that no voice signals are lost during a period of time to determine whether a speech signal has voice activity or no voice activity."

However, Applicants respectfully suggest that the Office Action has incorrectly interpreted and characterized both the **Li** and the **Clemm** references in an attempt to show equivalence to the claimed system.

For example, as summarized in col. 1, lines 7-16 of the **Li** reference, **Li** generally describes a technique for "improving the estimation of background noise energy in a communication channel by a G.729 voice activity detection (VAD) device." In other words, **Li** provides a technique for improving "...the ability of the G.729 VAD to distinguish voice energy from background noise energy..." This determination allows the scheme described by **Li** to reduce transmission bandwidth requirements during periods of noise (i.e., periods of non-speech).

In referring to the communications specification ITU G.729, **Li** further describes the claimed scheme as a solution that **must** "improve upon the Recommendation without departing from its requirements. The key to achieving this is to make the condition for

updating the background noise parameters independent of the value of the updated parameters...” In other words, the **Li** reference explains that it provides a technique for improving on the thresholds used for the multi-level VAD (voice activity detection) without departing from the requirements of the ITU G.729 specification.

In col. 2, lines 30-38, **Li** explains that “a final VAD decision is made based on the relationship between the detected energy of the current frame and that of neighboring **past frames**...” (emphasis added). In other words, as described in col. 7, line 4 through col. 8, line 67, **Li** computes dynamic voice and noise thresholds based on running averages of **past segments** of noise and voice components of the signal. Whenever a “block energy” of a current frame of the signal exceeds one of these dynamic thresholds, the VAD described by the **Li** reference uses this information in making a determination as to whether a **current** frame is noise or voice.

Consequently, adding the buffering described by the **Clemm** reference seems to create a combination reference wherein the incoming signal frames (unless already identified as speech) are buffered for some relatively short period of time prior to identification of speech in the signal. Then, as soon as a **current frame** of the signal is determined to represent a speech signal based on the dynamic thresholds computed as a function of the **running averages** of block energies of **previous frames**, then all or part of the content of the buffer will be encoded and transmitted as speech.

In stark contrast, the Applicants specifically describe and claim buffering **only unknown segments** “until analysis of a **subsequent frame** identifies the subsequent segment type as any of a speech segment and a silence segment” at which time, the buffered segments are encoded either as speech or non-speech based on the type of the **subsequent frame**.

In other words, the speech determination for a **current frame** performed by **Li** is based on a **running evaluation of past frames** (i.e. the aforementioned “running average”), while the claimed system classifies **prior frames** as speech or non-speech

based solely on an **evaluation of subsequent frames**. Therefore, unlike *Li*, the claimed analysis of the current frame is not dependent upon the prior frames. Clearly, the proposed *Li - Clemm* combination reference fails completely to disclose the claimed limitations of independent claim 1.

Therefore, it should be clear that independent claim 1 includes elements ***not taught*** in the proposed *Li - Clemm* combination reference. Consequently, the rejection of independent claim 1 and of dependent claims 2-4 and 14 under 35 U.S.C. §103(a) is not proper. Therefore, the Applicants respectfully traverse the rejection of claims 1-4 and 14, and request reconsideration of the rejection of these claims under 35 U.S.C. §103(a) in view of the novel language of claim 1. In particular, claim 1 recites the following novel language:

“A system for encoding an audio signal, comprising:

analyzing sequential segments of at least one digital audio signal to determine segment type as one of speech type segments, non-speech type segments, and unknown type segments;

encoding each speech segment as one or more signal frames using a speech segment-specific encoder;

encoding each non-speech frame as one or more signal frames using a non-speech segment-specific encoder;

buffering each sequential unknown type segment in a segment buffer until analysis of a subsequent segment identifies the subsequent segment type as any of a speech segment and a silence segment; and

encoding the buffered segments and the subsequent segment as one or more signal frames using the segment-specific encoder corresponding to the type of the subsequent segment.” emphasis added)

3.2 Rejection of Claims 15, 16 and 21-23:

In general, the Office Action rejected independent claim 15 under 35 U.S.C. §103(a) over the proposed ***Li - Clemm*** combination reference using the same rationale as discussed above with respect to the rejection of claim 1. Specifically, the Office Action simply combined the rejection of independent claims 1, 15, 24, and 31 without specifically differentiating between these claims.

As discussed above with respect to the rejection of claim 1, the speech determination for a ***current frame*** performed by ***Li*** is based on a ***running evaluation of past frames*** (i.e. the aforementioned “running average”).

In contrast, the system described by independent claim 15 buffers ***unknown*** frame types, and then automatically identifies those buffered frames as having the same type as a ***current frame*** when the ***evaluation of the current frame indicates that it is either speech or non-speech***. Unlike ***Li***, the claimed evaluation of the current frame is not dependent upon the prior frames.

Therefore, it should be clear that independent claim 15 includes elements ***not taught*** in the proposed ***Li - Clemm*** combination reference. Consequently, the rejection of independent claim 15 and of dependent claims 16 and 21-23 under 35 U.S.C. §103(a) is not proper. Therefore, the Applicants respectfully traverse the rejection of independent claim 15 and dependent claims 16 and 21-23, and request reconsideration of the rejection of these claims under 35 U.S.C. §103(a) in view of the novel language of claim 15. In particular, claim 15 recites the following novel language:

“A system for encoding speech onset in a signal, comprising:
continuously analyzing and encoding sequential frames of at least one digital audio signal while analysis of the sequential frames indicates that the sequential frames is of a frame type including any of a speech type signal frame and a non-speech type signal frame;

continuously analyzing and buffering sequential frames of the at least one digital audio signal while analysis of each sequential frame is unable to determine whether each sequential frame is of a frame type including any of the speech type signal frame and the non-speech type signal frame;

automatically identifying at least one of the buffered sequential frames as having the same type as a current sequential frame when analysis of the current sequential frame indicates that it is of a frame type including any of the speech type signal frame and the non-speech type signal frame; and

encoding the buffered sequential frames.” (emphasis added)

3.3 Rejection of Claims 24 and 28-30:

In general, the Office Action rejected independent claim 24 under 35 U.S.C. §103(a) over the proposed ***Li - Clemm*** combination reference using the same rationale as discussed above with respect to the rejection of claim 1. Specifically, the Office Action simply combined the rejection of independent claims 1, 15, 24 and 31 without specifically differentiating between these claims.

As discussed above with respect to the rejection of claim 1, the speech determination for a ***current frame*** performed by ***Li*** is based on a ***running evaluation of past frames*** (i.e. the aforementioned “running average”).

In contrast, the process described by independent claim 24 buffers ***unknown*** frame types, and then automatically identifies those buffered frames as having the same type as a ***subsequent frame*** when the **analysis of the subsequent frame indicates that it is either speech or non-speech**. Unlike ***Li***, the claimed analysis of the subsequent frame is not dependent upon the prior frames.

Therefore, it should be clear that independent claim 24 includes elements ***not taught*** in the proposed ***Li - Clemm*** combination reference. Consequently, the rejection of independent claim 24 and of dependent claims 28-30 under 35 U.S.C. §103(a) is not proper. Therefore, the Applicants respectfully traverse the rejection of independent claim 24 and dependent claims 28-30, and request reconsideration of the rejection of these claims under 35 U.S.C. §103(a) in view of the novel language of claim 24. In particular, claim 24 recites the following novel language:

“A computer-implemented process for encoding at least one frame of a digital audio signal, comprising:
encoding a current frame of the audio signal when it is determined that the current frame of the audio signal includes any of speech and non-speech;
buffering the current frame of the audio signal in a frame buffer when it can not be determined whether the current frame of the audio signal includes any of speech and non-speech;
sequentially analyzing and buffering subsequent frames of the audio signal until analysis of the subsequent frames identifies a frame including any of speech and non-speech;
temporally compressing each buffered frame; and
encoding the temporally compressed frames as one or more signal frames.” (emphasis added)

3.4 Rejection of Claims 31, 32 and 36:

In general, the Office Action rejected independent claim 31 under 35 U.S.C. §103(a) over the proposed ***Li - Clemm*** combination reference using the same rationale as discussed above with respect to the rejection of claim 1. Specifically, the Office Action simply combined the rejection of independent claims 1, 15, 24 and 31 without specifically differentiating between these claims.

As discussed above with respect to the rejection of claim 1, the speech determination for a **current frame** performed by **Li** is based on a **running evaluation of past frames** (i.e. the aforementioned “running average”).

In contrast, the process described by independent claim 31 buffers **unidentified** frame types, and then automatically identifies those buffered frames as having the same type as a **subsequent frame** when the **analysis of the current frame indicates that it is either speech or non-speech**. Unlike **Li**, the claimed analysis of the current frame is not dependent upon the prior frames.

Therefore, it should be clear that independent claim 31 includes elements **not taught** in the proposed **Li - Clemm** combination reference. Consequently, the rejection of independent claim 31 and of dependent claims 32 and 36 under 35 U.S.C. §103(a) is not proper. Therefore, the Applicants respectfully traverse the rejection of independent claims 31 and dependent claims 32 and 36, and request reconsideration of the rejection of these claims under 35 U.S.C. §103(a) in view of the novel language of claim 31. In particular, claim 31 recites the following novel language:

“A method for capturing speech onset in a digital audio signal,
comprising:

sequentially analyzing and encoding chronological frames of a digital audio signal when an analysis of the chronological frames identifies the presence of any of speech and non-speech in the frames of the digital audio signal;

buffering all chronological frames of the digital audio signal when the analysis of the chronological frames is unable to identify a presence of any of speech and non-speech in the frames of the digital audio signal;

identifying at least one of the buffered chronological frames as having a same content type as a current chronological frame of the digital audio signal when the analysis the current chronological frame

identifies the presence of any of speech and non-speech in the digital signal following the buffering of any chronological frames; and encoding the current chronological frame and at least one of the buffered chronological frames.” (emphasis added)

4.0. Rejection of Dependent Claims 8-9, 11-14, 17-20, 25-27 and 33-35:

In general, the Office Action rejected dependent claims 8-9, 11-14, 17-20, 25-27 and 33-35 under 35 U.S.C. §103(a) over the proposed ***Li - Clemm*** combination reference in combination with various other references. Specifically, the Office Action suggests that independent claims 1, 15, 24 and 31 are disclosed by the ***Li - Clemm*** combination reference, while the various dependent claims are disclosed in view of those reference in further view of various additional references.

However, it should be noted that as discussed in the preceding paragraphs, independent claims 1, 15, 24 and 31 are patentable under 35 U.S.C. §103(a). Further, claims 8-9, 11-14, 17-20, 25-27 and 33-35 depend from these allowable claims.

Consequently, because there is no valid rejection of the parent claims (claims 1, 15, 24 and 31), the use of additional references to address a particular feature of a dependent claim is insufficient to provide valid grounds for rejection of the dependent claim (claims 8-9, 11-14, 17-20, 25-27 and 33-35). Consequently, as there is no valid rejection of claim 1, the Applicants respectfully traverse the rejection of claims 8-9, 11-14, 17-20, 25-27 and 33-35 under 35 U.S.C. §103(a) based on the novel language of independent claims 1, 15, 24 and 31, as cited above.

CONCLUSION

In view of the above discussion, it is respectfully submitted that claims 1-36 are in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of claims 1-4 and 8-36 and objection to claims 5-7, and to pass this application to issue at the earliest opportunity. Additionally, in an effort to further the prosecution of the subject application, the Applicant kindly invites the Examiner to telephone the Applicant's attorney at (805) 278-8855 if the Examiner has any additional questions or concerns.

Respectfully submitted,

A handwritten signature in black ink that reads "Mark A. Watson". The signature is written in a cursive style with a horizontal line extending from the end of the name.

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